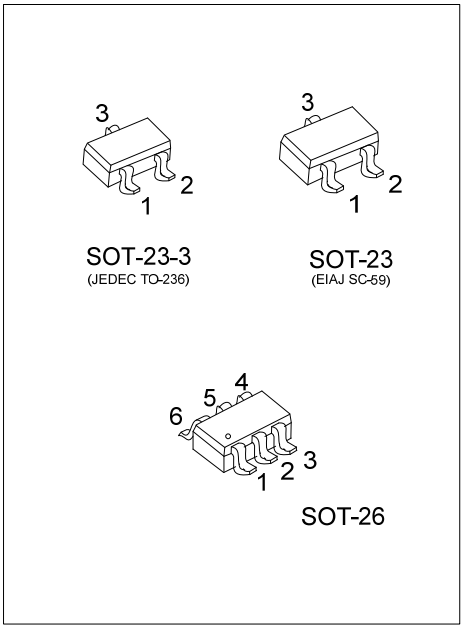
UTC654

Power MOSFET

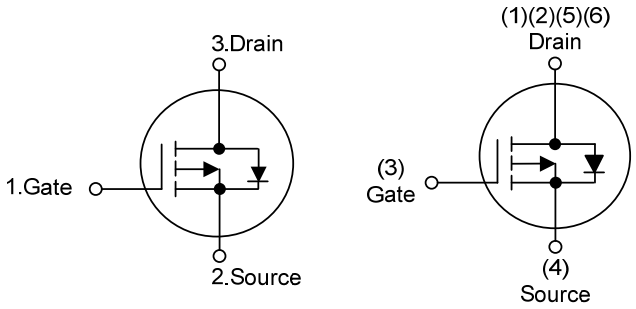
P-CHANNEL ENHANCEMENT MODE POWER MOSFET



■ DESCRIPTION

As P-Channel Logic Level MOSFET, **UTC654** has been optimized for battery power management applications. And it's produced using UTC's advanced Power Trench process.

■ SYMBOL

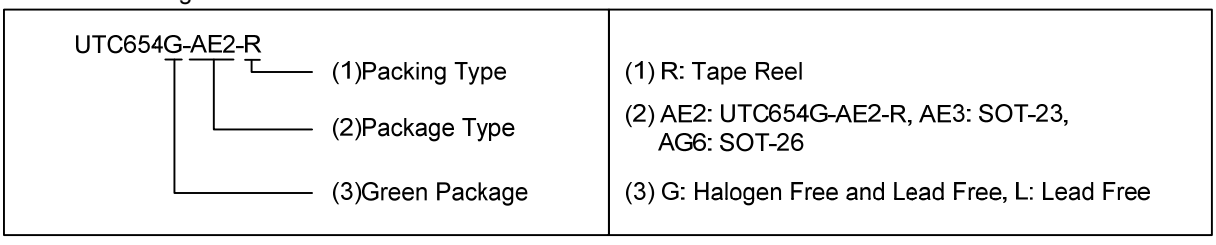


SOT-23-3/SOT-23 SOT-26

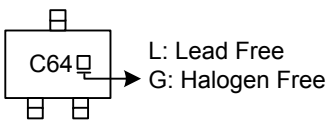
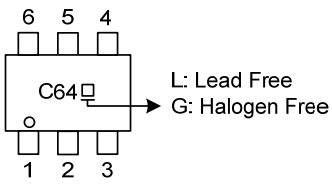
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UTC654L-AE2-R	UTC654G-AE2-R	SOT-23-3	G	S	D	-	-	-	Tape Reel
UTC654L-AE3-R	UTC654G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UTC654L-AG6-R	UTC654G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

Note: Pin Assignment: G: Gate S: Source D: Drain



■ MARKING

SOT-23-3 / SOT-23	SOT-26
	

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±20	
Continuous Drain Current (Note 3)		I_D	-3.6	A
Pulsed Drain Current (Note 2)		I_{DM}	-10	
Power Dissipation	SOT-23-3	P_D	1.1	W
	SOT-23		1.38	W
	SOT-26		1.6	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	113	°C/W
	SOT-23		90	°C/W
	SOT-26		78	°C/W
Junction to Case	SOT-23-3	θ_{JC}	37	°C/W
	SOT-23		32	°C/W
	SOT-26		30	°C/W

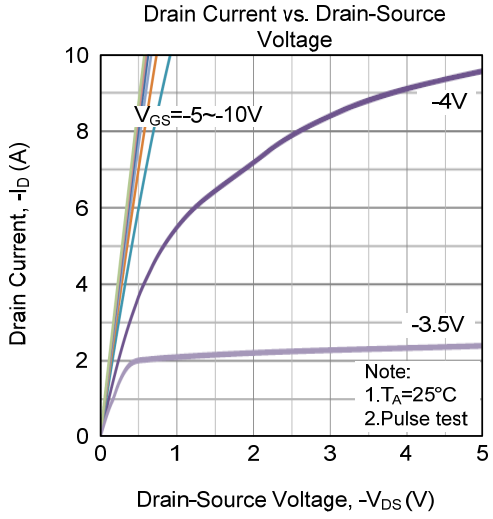
Note: Surface mounted on 1 in^2 copper pad of FR4 board; 270 °C/W when mounted on min.

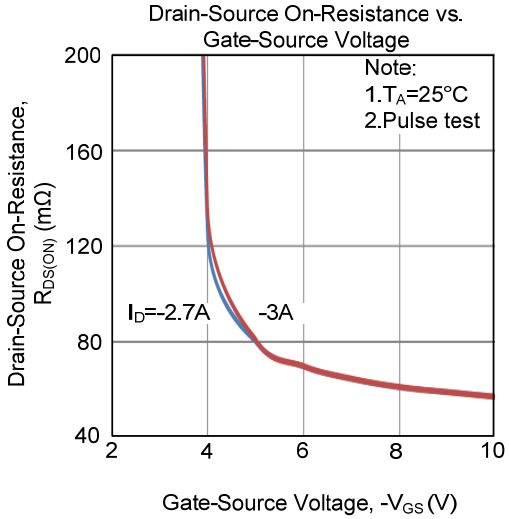
■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

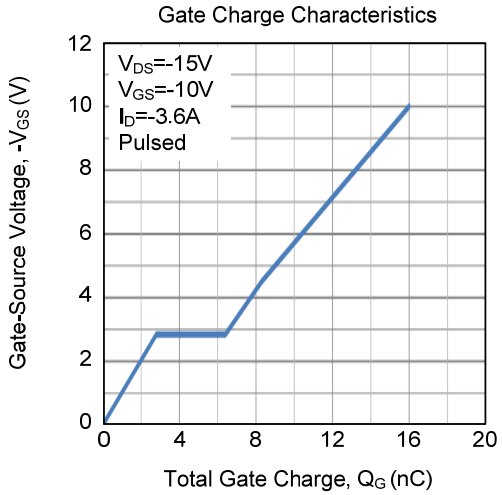
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D =-250μA	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_G =±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0		-3.0	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-3.6A			75	mΩ
		V_{GS}=-4.5V, I_D=-2.7A			125	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=-15V, V_{GS}=0V, f=1.0MHz		655		pF
Output Capacitance	C_{OSS}			124		
Reverse Transfer Capacitance	C_{RSS}			104		
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 2)	Q_G	V_{DS}=-15V, V_{GS}=-10V, I_D=-3.6A, I_G=1mA		14.4		nC
Gate-Source Charge	Q_{GS}			3.4		
Gate-Drain Charge	Q_{GD}			2.4		
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{DD}=-15V, I_D=-3.6A, V_{GS}=-10V, R_G=3.3Ω		4.2		ns
Turn-ON Rise Time	t_R			15.6		
Turn-OFF Delay Time	$t_{D(OFF)}$			18.4		
Turn-OFF Fall-Time	t_F			16.8		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain Source Diode Forward Current	I_S				-3.6	A
Maximum Body-Diode Pulsed Current	I_{SM}				-10	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1.3A (Note 2)			-1.2	V

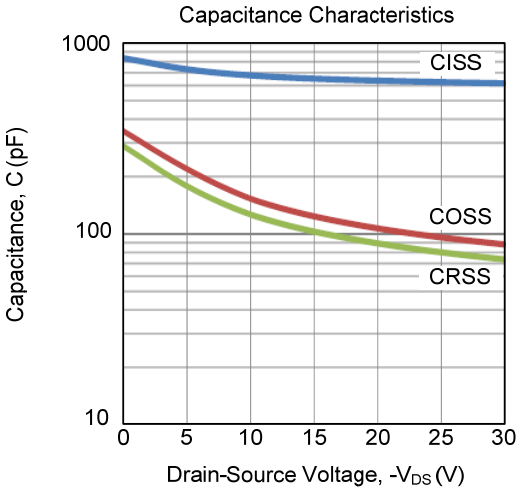
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

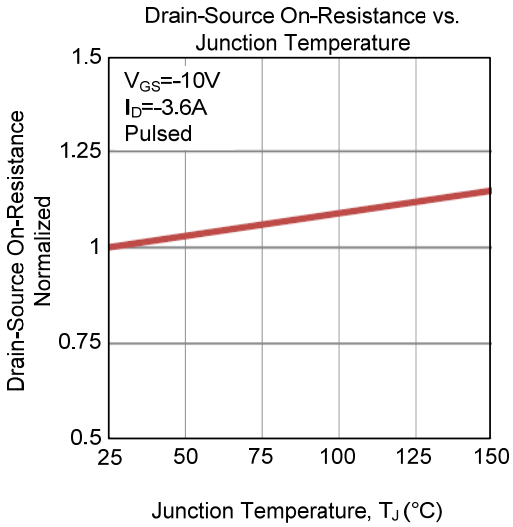
■ TYPICAL CHARACTERISTICS

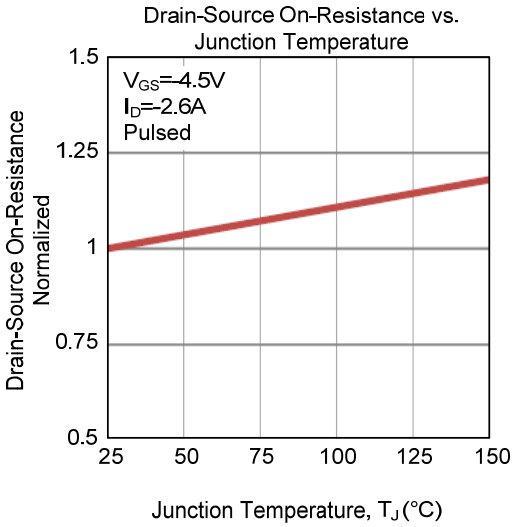






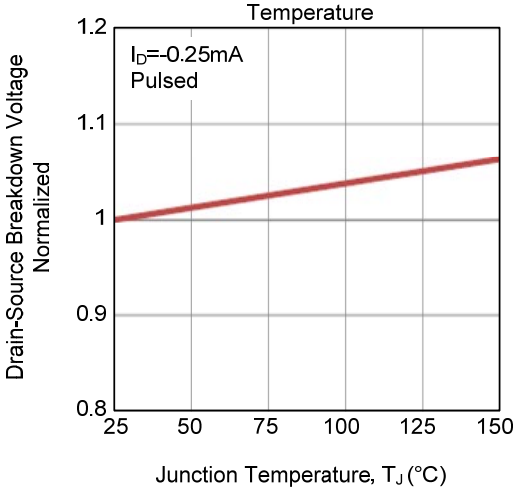




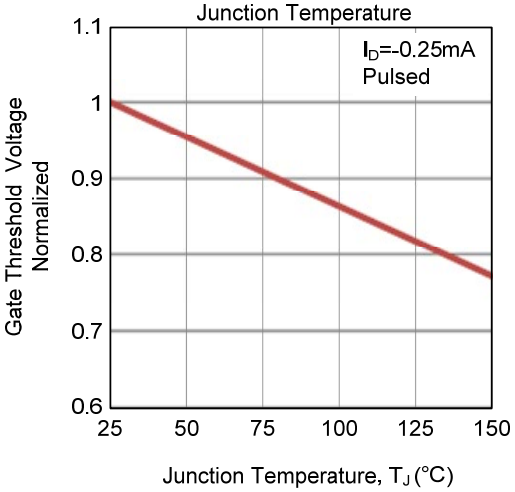


■ TYPICAL CHARACTERISTICS (Cont.)

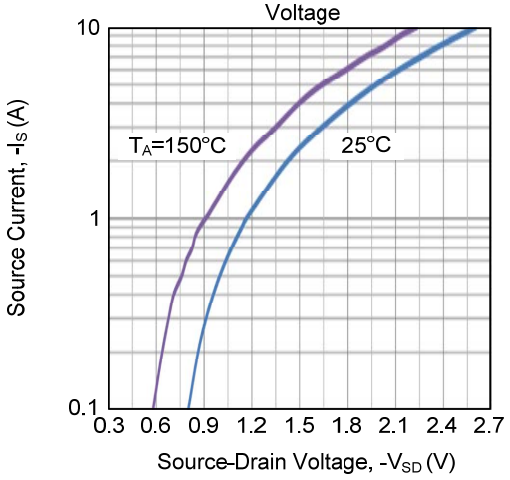
Breakdown Voltage vs. Junction Temperature



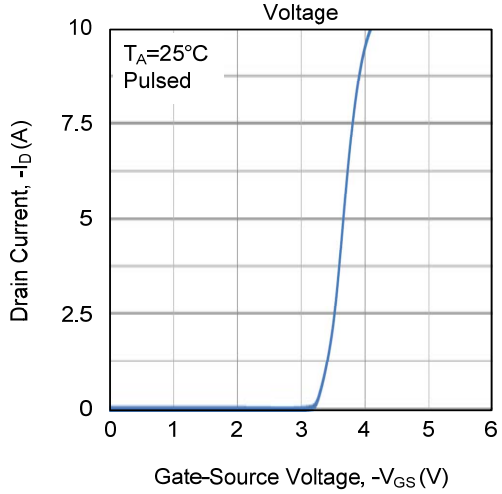
Gate Threshold Voltage vs. Junction Temperature



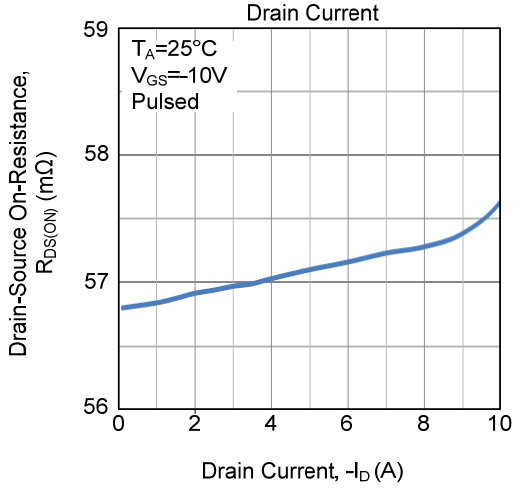
Source Current vs. Source-Drain Voltage



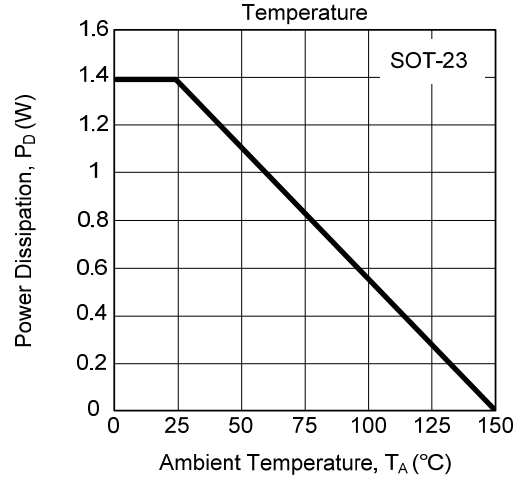
Drain Current vs. Gate-Source Voltage



Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Ambient Temperature



■ TYPICAL CHARACTERISTICS (Cont.)