

# SwitchMax Power Transistors

## Features

- Excellent switching performance at high voltage and current (to 650 V  $V_{CEV}$ , 15 A  $I_C(\text{sat})$ )
- 100% testing of switching parameters, including turn-off time and saturation voltage, at  $T_C=25^\circ\text{C}$  and  $T_C \geq 100^\circ\text{C}$  to provide limit values for worst-case design
- Controlled-lifetime production process to provide higher gain for a given base width and assure stable current gain during operation at elevated temperatures
- Fast switching speeds
- High safe-operating-area (SOA) ratings
- Multiple-epitaxial, double-diffused, rugged structure

## Applications

- Off-line switching power supplies
- Converters
- High-voltage inverters
- Pulse-width-modulated regulators
- Switching regulators
- Other high-voltage switching applications

$I_C(\text{sat})$		5 A	10 A	15 A	
$V_{CEV}$	450 V	2N6671	2N6674	2N6676	
	550 V	2N6672		2N6677	
	650 V	2N6673	2N6675	2N6678	
CHARACTERISTIC	$T_C$ $^\circ\text{C}$	LIMITS			UNITS
$I_{CEV}^\Delta$	25	0.1	0.1	0.1	mA
	$\geq 100$	1	2	1	
$V_{CE(\text{sat})}^\Delta$	25	1	1	1	V
	$\geq 100$	2	2	2	
$t_r^\Delta$	25	0.5	0.6	0.6	$\mu\text{s}$
	$\geq 100$	0.8	1	1	
$t_s^\Delta$	25	2.5	2.5	2.5	$\mu\text{s}$
	$\geq 100$	4	4	4	
$t_f^\Delta$	25	0.4	0.5	0.5	$\mu\text{s}$
	$\geq 100$	0.8	1	1	
$t_c^\Delta$	25	0.4	0.5	0.5	$\mu\text{s}$
	$\geq 100$	0.8	0.8	0.8	

$\Delta$ Max. at  $V_{CE}=V_{CEV}$        $\Delta$ Max. at  $I_C(\text{sat})$

Note: High-temperature tests on 5-A types (2N6671-2N6673) are performed at  $125^\circ\text{C}$ ; on 10-A and 15-A types (2N6674-2N6678) at  $100^\circ\text{C}$ .

# High-Speed-Switching Power Transistors

## Features

- Multiple-epitaxial or multiple-diffused structure
- n-p-n and p-n-p complementary pairs available
- Excellent high-frequency capability
- Fast saturated switching speeds
- High dissipation capability
- Low  $V_{CE(\text{sat})}$  voltages
- High pulsed beta at high  $I_C$
- Maximum safe-operating-area curves
- High  $I_C$  ratings
- Thermal-cycling ratings
- Radiation-hardened and high-reliability types for aerospace and military applications
- Available in JEDEC TO-3, modified TO-3, TO-39, TO-66, TO-202 packages, and in  $\frac{3}{4}$ "-diameter packages with radial leads

## Applications

- High-speed, high-power, high-current switching and amplifier circuits
- Large-signal, general-purpose applications such as complementary vertical deflection, TV sound output, regulator and driver output stages of audio regulators, and driver and output stages of audio amplifiers
- Small-signal, medium-power applications
- For aerospace and military applications
- High-switching-speed and linear-amplifier applications in audio, ultrasonic, and rf circuits

RCA Family	Structure	$I_C$ Max. A	$P_T$ Max. W	$V_{CE0}(\text{sus})$ Range V	$V_{CE(\text{sat})}$ Range V	Beta Selection Range		$t_r$ Max. $\mu\text{s}$	$t_f$ Max. $\mu\text{s}$	Comp. Family
						$h_{FE}$ Min.	At $I_C$ A			
2N2102	n-p-n	1	5	30-90	0.5-1.5	30-50	0.15-1	—	—	2N4036
2N4036	p-n-p	1	7	30-65	0.65-1.5	20-50	0.15	—	—	2N2102
2N5320	n-p-n	2	10	50-75	0.5-2	30-70	0.3-0.5	0.08 $\square$	0.8 $\blacksquare$	2N5322
2N5322	p-n-p	2	10	50-75	0.7-1.2	30-70	0.3	0.1 $\square$	1 $\blacksquare$	2N5320
RCP701	n-p-n	2	10	30-100	0.8-1.2	50	0.5	—	—	RCP700
RCP700	p-n-p	2	10	30-100	0.8-1.2	50	0.5	—	—	RCP701
2N3879	n-p-n	7	35	50-90	1.2-2	10-40	0.5-4	0.4	0.4	
2N6480	n-p-n	12	117	60-80	0.75	20	12	—	—	
2N6482	n-p-n	12	117	60-80	0.75	20	12	—	—	
2N5038	n-p-n	20	140	75-120	1	20	5	0.5	0.5	
2N3265	n-p-n	25	125	60-90	0.75-1.2	20-25	15	0.5	2	
2N3263	n-p-n	25	125	60-90	0.75-1.2	20-25	15	0.5	2	
2N5671	n-p-n	30	140	90-120	0.75	20	20	0.5 $\square$	0.5	
2N6033	n-p-n	50	140	90-120	1-1.3	10	40-50	1	0.5	

$\square$   $t_{ON}$        $\blacksquare$   $t_{OFF}$

Note: For p-n-p types voltages and currents are negative.